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**TRANSMITTAL  
FORM**

(to be used for all correspondence after initial filing)

<b>TRANSMITTAL FORM</b>  (to be used for all correspondence after initial filing)	Application Number	10/627,194	
	Filing Date	July 24, 2003	
	First Named Inventor	Sankar SAMBASIVAN	
	Art Unit	1755	
	Examiner Name	Stephen J. Stein	
Total Number of Pages in This Submission		Attorney Docket Number	7125

**ENCLOSURES (check all that apply)**

<input type="checkbox"/> Fee Transmittal Form <input type="checkbox"/> Fee Attached <input type="checkbox"/> Amendment / Reply <input type="checkbox"/> After Final <input type="checkbox"/> Affidavits/declaration(s) <input type="checkbox"/> Extension of Time Request <input type="checkbox"/> Express Abandonment Request <input checked="" type="checkbox"/> Information Disclosure Statement <input type="checkbox"/> Certified Copy of Priority Document(s) <input type="checkbox"/> Reply to Missing Parts/ Incomplete Application <input type="checkbox"/> Reply to Missing Parts under 37 CFR1.52 or 1.53	<input type="checkbox"/> Drawing(s) <input type="checkbox"/> Licensing-related Papers <input type="checkbox"/> Petition <input type="checkbox"/> Petition to Convert to a Provisional Application <input type="checkbox"/> Power of Attorney, Revocation Change of Correspondence Address <input type="checkbox"/> Terminal Disclaimer <input type="checkbox"/> Request for Refund <input type="checkbox"/> CD, Number of CD(s) _____ <input type="checkbox"/> Landscape Table on CD	<input type="checkbox"/> After Allowance Communication to TC <input type="checkbox"/> Appeal Communication to Board of Appeals and Interferences <input type="checkbox"/> Appeal Communication to TC (Appeal Notice, Brief, Reply Brief) <input type="checkbox"/> Proprietary Information <input type="checkbox"/> Status Letter <input checked="" type="checkbox"/> Other Enclosure(s) (please identify below): <ul style="list-style-type: none"><li>• Return receipt postcard</li><li>• Transmittal of IDS . . . Before Mailing of First Office Action</li><li>• Copies of cited foreign patents and non-patent references</li></ul>
<b>Remarks</b>		

**SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT**

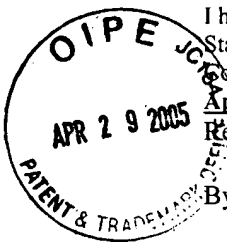
Firm	Reinhart Boerner Van Deuren s.c.		
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Printed Name	Antonia M. Holland		
Date	April 26, 2005	Reg. No.	53,840

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Reinhardt Boerner Van Deuren s.c.

By: Antonia M. Holland  
Antonia M. Holland

## PATENT APPLICATION

Date: April 26, 2005

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

GROUP ART UNIT: 1755

EXAMINER: STEPHEN J. STEIN

In re application of: )  
Sankar Sambasivan )  
Application No: 10/627,194 )  
Filed: July 24, 2003 )  
Confirmation No.: 2708 )  
Attorney Docket No. 7125 )  
Customer No. 22922 )

For: ALUMINUM PHOSPHATE  
COMPOUNDS,  
COMPOSITIONS, MATERIALS  
AND RELATED METAL  
COATINGS

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

April 26, 2005

### TRANSMITTAL OF INFORMATION DISCLOSURE STATEMENT WITHIN THREE MONTHS OF FILING OR BEFORE MAILING OF FIRST OFFICE ACTION (37 CFR 1.97(b))

**NOTE:** "An information disclosure statement shall be considered by the Office if filed: (1) within three months of the filing date of a national application; (2) within three months of the date of entry of the national stage as set forth in § 1.491 in an international application; or (3) before the mailing date of a first Office action on the merits, whichever event occurs last." 37 CFR 1.97(b).

**NOTE:** The "filing date of a national application" under 37 CFR 1.97(b) has two possible meanings. Where the filing is a direct one to the United States Patent & Trademark Office, the filing is defined in 37 CFR 1.53(b) as "the date on which: (1) A specification containing a description pursuant to § 1.71 and at least one claim pursuant to § 1.75; and (2) any drawing required by § 1.81(a), are filed in the Patent

and Trademark Office in the name of the actual inventor or inventors as required by § 1.41." 37 CFR 1.97(b)(1). On the other hand, an international application that enters the national stage occurs when the applicant has filed the documents and fees required by 35 U.S.C. § 371(c) within the periods set forth in § 1.494 or § 1.495. 35 U.S.C. § 371(c) requires the filing of the following: (1) the national fee; (2) a copy of the international application, unless already sent by the International Bureau, and an English translation if filed in another language; (3) amendments under PCT Article 19, with a translation into English if made in another language; (4) an oath or declaration; and (5) a translation into English of any annexes to the International preliminary examination report, if such annexes were made in another language. 37 CFR 1.97(b)(2).

## IDENTIFICATION OF TIME OF FILING THE ACCOMPANYING INFORMATION DISCLOSURE STATEMENT

The information disclosure statement submitted herewith is being filed within three months of the filing date of the application or date of entry into the national stage of an international application or before the mailing date of a first Office action on the merits, whichever event occurs last. 37 CFR 1.97(b).

**NOTE:** "No certification or fee is due when the filing is made within the above time period. It is advisable to ensure that no Office action has been mailed if the disclosure statement is delayed until after three months from filing.

**NOTE:** "An information disclosure statement will be considered to have been filed on the day it was received in the Office, or on an earlier date of a mailing if accompanied by a properly executed certificate of mailing under 37 CFR 1.8, or Express Mail certificate under 37 CFR 1.10. An Office action is mailed on the date indicated in the Office action." Notice of April 20, 1992 (1138 O.G. 37-41, 39).

**NOTE:** "The term 'national application' includes continuing applications (continuations, divisions, continuations-in-part) so three months will be measured from the actual filing date of an application as opposed [sic] to the effective date of a continuing application." Notice of April 20, 1992 (1138 O.G. 37-41, 39).

**NOTE:** "An action on the merits means an action which treats the patentability of the claims in an application, as opposed to only formal or procedural requirements. An action on the merits would, for example, contain a rejection or indication of allowability of a claim or claims rather than just a restriction requirement (37 CFR 1.142) or just a requirement for additional fees to have a claim considered (37 CFR 1.16(d)). Thus, if an application was filed on Jan. 1 and the first Office action on the merits was not mailed until six months later on July 1, the examiner would be required to consider any proper information disclosure statement filed prior to July 1." Notice of April 20, 1992 (1138 O.G. 37-41, 39).

**WARNING:** "A petition for suspension of action to allow applicant time to submit an information disclosure statement will be denied as failing to present good and sufficient reasons, since 37 CFR 1.97 provides adequate recourse for the timely submission of prior art for consideration by the examiner." Notice of July 6, 1992 (1141 O.G. 63).

Dated: April 26, 2005  
Reg. No. 53,840  
Tel. No.: (414) 298-8285



SIGNATURE OF ATTORNEY

Antonia M. Holland

Reinhart Boerner Van Deuren s.c.

(P.O. Address)

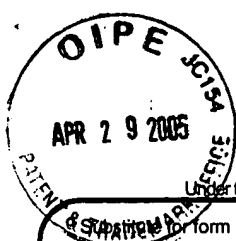
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**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**

(Use as many sheets as necessary)

Sheet 1 of 4

**Complete if Known**

Application Number	10/627,194
Filing Date	July 24, 2003
First Named Inventor	Sankar SAMBASIVAN
Art Unit	1755
Examiner Name	Stephen J. Stein
Attorney Docket Number	7125

**U.S. PATENT DOCUMENTS**

Examiner Initials *	Cite No. <sup>1</sup>	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number - Kind Code <sup>2</sup> (if known)			
	AA	US 2,165,819	07-11-1939	Albers-Schonberg	
	AB	US- 3,323,889	06-06-1967	Carl et al.	
	AC	US- 3,450,574	06-17-1969	Reed	
	AD	US- 3,516,811	06-23-1970	Gatchet et al.	
	AE	US- 3,694,299	09-26-1972	Wagner	
	AF	US- 3,711,322	01-16-1973	Kushihashi et al.	
	AG	US- 3,793,105	02-19-1974	Birchall et al.	
	AH	US- 3,847,583	11-12-1974	Dislich et al.	
	AI	US- 3,870,737	03-11-1975	Birchall et al.	
	AJ	US- 3,926,103	12-16-1975	Smith	
	AK	US- 3,943,231	03-09-1976	Wasel-Nielsen	
	AL	US- 3,960,592	06-01-1976	Birchall et al.	
	AM	US- 3,984,591	10-05-1976	Plumat et al.	
	AN	US- 4,005,172	01-25-1977	Birchall et al.	
	AO	US- 4,005,232	01-25-1977	Coleboume et al.	
	AP	US 4,008,299	02-15-1977	Birchall et al.	
	AQ	US- 4,289,863	09-15-1981	Hill et al.	
	AR	US- 4,551,852	11-05-1985	Compen et al.	
	AS	US- 5,030,431	07-09-1991	Glemza	
	AT	US- 5,146,743	09-15-1992	Maus et al.	

**FOREIGN PATENT DOCUMENTS**

Examiner Initials *	Cite No. <sup>1</sup>	Foreign Patent Document	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T <sup>6</sup>
		Country Code <sup>3</sup> - Number <sup>4</sup> - Kind Code <sup>5</sup> (if known)				
	1	JP 02142881	05-31-1990	Akebono Brake Chuo Gijutsu		
	2	JP 5229911	07-20-1993	Voltronics Corp.		
	3	JP 53011200	02-01-1978	Negahama et al.		
	4	JP 401036774	02-07-1989	Nippon Parkerizing Co., Ltd.		
	5	EP 000302465	02-08-1989	Nihon Parkerizing		
	6	EP 0539342	04-28-1993	Griffith		
	7	FR 2156800	01-06-1973	ICI, Ltd.		
	8	FR 2176469	02-11-1973	No information		
	9	GB 1192304	05-20-1970	No information		

Examiner  
SignatureDate  
Considered

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**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**

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Sheet

2

of

4

**Complete if Known**

Application Number	10/627,194
Filing Date	July 24, 2003
First Named Inventor	Sankar SAMBASIVAN
Art Unit	1755
Examiner Name	Stephen J. Stein
Attorney Docket Number	7125

**NON PATENT LITERATURE DOCUMENTS**

Examiner Initials *	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T <sup>2</sup>
	1	DAVIÉRO, S., AVINENS, C., IBANEZ, A., GIUNTINI, J.C., and PHILIPPOT, E., "Couches Minces Diélectriques de Phosphate d'Aluminium", J. Phys. III, 25 September 1992, pp. 745-756. (English Abstract included).	
	2	ROTHON, ROGER N., "Novel, Low Curing Temperature, Glassy, Inorganic Coatings, Derived from Soluble Complexes of Aluminum and Other Metal Phosphates", Chemistry and Industry, 1 June 1974, pp. 457-459.	
	3	DAVIÉRO, S., AVINENS, C., IBANEZ, A., GIUNTINI, J.C., and PHILIPPOT, E., "Dielectric Properties of Amorphous Aluminum Phosphate Thin Films", Journal of Non-Crystalline Solids 146, 1992, pp. 279-284.	
	4	DAVIÉRO, S., AVINENS, C., IBANEZ, A., GIUNTINI, J.C., and PHILIPPOT, E., "A Structural Study of Amorphous Aluminum Phosphate Thin Films by X-Ray Absorption Spectroscopy", Thin Solid Films, 226, 1993, 207-214.	
	5	WEBER, Ch., FIELD, R., and HÖFER, H.H., "Characterization of Aluminum Phosphate Gel", Key Engineering Materials, Vol. 150, 1998, pp. 199-208.	

Examiner  
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\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup> Applicant's unique citation designation number (optional). <sup>2</sup> Applicant is to place a check mark here if English language Translation is attached. This collection of information is required by 37 CFR 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 120 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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Sheet 3 of 4

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Application Number	10/627,194
Filing Date	July 24, 2003
First Named Inventor	Sankar SAMBASIVAN
Art Unit	1755
Examiner Name	Stephen J. Stein
Attorney Docket Number	7125

**U.S. PATENT DOCUMENTS**

Examiner Initials *	Cite No. <sup>1</sup>	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number - Kind Code <sup>2</sup> (if known)			
	AU	US 5,208,069	05-04-1993	Clark et al.	
	AV	US 5,223,336	06-29-1993	Griffith et al.	
	AW	US 5,292,701	03-08-1994	Glemza et al.	
	AX	US 5,348,694	09-20-1994	Goldberger	
	AY	US 5,411,711	05-02-1995	Swars	
	AZ	US 5,496,529	03-05-1996	Fogel et al.	
	BA	US 5,552,361	09-03-1996	Rieser et al.	
	BB	US 5,665,463	09-09-1997	Morgan et al.	
	BC	US 5,698,758	12-16-1997	Rieser et al.	
	BD	US 5,707,442	01-13-1998	Fogel et al.	
	BE	US 5,744,777	04-28-1998	Bernecki et al.	
	BF	US 5,856,027	01-05-1999	Murphy	
	BG	US 6,022,513	02-08-2000	Pecoraro et al.	
	BH	US 6,036,762	03-14-2000	Sambasivan	
	BI	US 6,140,410	10-31-2000	Kolouch	
	BJ	US 6,162,498	12-19-2000	Mennig et al.	
	BK	US 6,221,955	04-24-2001	Mequanint et al.	
	BL	US 6,312,819	11-06-2001	Jia et al.	
	BM	US 6,379,746	04-30-2002	Birch et al.	
	BN	US 6,383,989	05-07-2002	Jia et al.	

**FOREIGN PATENT DOCUMENTS**

Examiner Initials *	Cite No. <sup>1</sup>	Foreign Patent Document	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T <sup>6</sup>
		Country Code <sup>3</sup> - Number <sup>4</sup> - Kind Code <sup>5</sup> (if known)				
	10	GB 1322722	07-11-1973	Birchall		
	11	GB 1322724	07-11-1973	Birchall, et al.		
	12	GB 1322726	07-11-1973	Birchall, et al.		
	13	GB 1396795	06-04-1975	Ferrie, et al.		
	14	GB 1451145	09-29-1976	Matsushima, et al.		
	15	GB 2021544	12-05-1979	Lam Partnership		
	16	WO 9821797	05-22-1998	Minn. Mining & Mfg.		
	17	WO 200142881	06-14-2001	B-Bop Assoc., Inc.		
	18	WO 0216263	02-28-2002	Applied Thin Films		

Examiner  
SignatureDate  
Considered

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. <sup>1</sup> Applicant's unique citation designation number (optional). <sup>2</sup> See Kinds Codes of USPTO Patent Documents at [www.uspto.gov](http://www.uspto.gov) or MPEP 901.04. <sup>3</sup> Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). <sup>4</sup> For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>5</sup> Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. <sup>6</sup> Applicant is to place a check mark here if English language Translation is attached.

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Substitute for form 1449A/PTO  <h2 style="text-align: center;">INFORMATION DISCLOSURE STATEMENT BY APPLICANT</h2> <p style="text-align: center;">(Use as many sheets as necessary)</p>		<b>Complete if Known</b> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">Application Number</td> <td>10/627,194</td> </tr> <tr> <td>Filing Date</td> <td>July 24, 2003</td> </tr> <tr> <td>First Named Inventor</td> <td>Sankar SAMBASIVAN</td> </tr> <tr> <td>Art Unit</td> <td>1755</td> </tr> <tr> <td>Examiner Name</td> <td>Stephen J. Stein</td> </tr> <tr> <td>Attorney Docket Number</td> <td>7125</td> </tr> </table>		Application Number	10/627,194	Filing Date	July 24, 2003	First Named Inventor	Sankar SAMBASIVAN	Art Unit	1755	Examiner Name	Stephen J. Stein	Attorney Docket Number	7125
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Sheet	4	of	4												

U.S. PATENT DOCUMENTS					
Examiner Initials *	Cite No. <sup>1</sup>	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number - Kind Code <sup>2</sup> (if known)			
	BO	US 6,403,164	06-11-2002	Jonschker et al.	
	BP	US 6,461,415	10-08-2002	Sambasivan et al.	
	BQ	US 6,589,661	07-08-2003	Neely, Jr. et al.	
	BR	US 2002/0054884	05-09-2002	Peetermans et al.	
	BS	US 2004/0011245	01-22-2004	Sambasivan et al.	
	BT	US 10/627,194		Sambasivan et al.	
	BU	US 10/642,069		Sambasivan et al.	
	BV	US 10/266,832		Sambasivan et al.	

FOREIGN PATENT DOCUMENTS						
Examiner Initials *	Cite No. <sup>1</sup>	Foreign Patent Document	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T <sup>6</sup>
		Country Code <sup>3</sup> - Number <sup>4</sup> - Kind Code <sup>5</sup> (if known)				
	19	RU 2148017	04-27-2000	Katalizator Aoot		

Examiner Signature		Date Considered	
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## Summary

The references and patents cited include several reports for obtaining amorphous aluminum phosphate films and bulk materials using both vapor-deposited and solution-derived methods. As is well known in the art, the chemical structure or composition of the final product of aluminum phosphate, whether obtained from pyrolysis or other methods, is different in each case such that the properties of the final product are well differentiated. The material of the Invention is unique in its microstructure, composition, and properties compared to all prior art methods. The stability of the amorphous aluminum phosphate taught in US patent 6,461,415 to above 1400 °C clearly suggest that the chemical structure or composition of the material must be unique at room temperature in order to exhibit such high temperature properties. The precursor and raw materials used in synthesis of the material of the Invention are entirely different from the prior art methods leading to the uniqueness of the final product comprising of substantially amorphous form of aluminum phosphate over a wide range of Al/P ratios. Thus both the product and process utilized are unique and is clearly differentiated from prior art methods.

Composite forms of the Inventive Material, such as a layer on a substrate, also constitute novelty and uniqueness. There are essentially three references that provide alternate ways of yielding amorphous aluminum phosphate on a substrate and the following arguments clearly distinguishes the product obtainable from the prior art references to that of the Inventive Material:

1. UK Patent 1, 451,145 clearly states that their chemical composition of the aluminum phosphate is  $\text{AlPO}_4 \cdot x \text{H}_2\text{O}$  which is a hydrated form of aluminum phosphate. Hydrated and hydroxide forms of phosphates of aluminum and other metals are well known in the paint industry for serving as primer layers. The use aluminum phosphate composition in the patent provides better corrosion protection. The deposition temperatures used in the patent do not exceed 90°C (substrate is immersed in hot solution). There is no heat treatment after deposition to drive off the water associated with the precursor solution and hence the composition is enriched with water of hydration. The composition of the Inventive Material is substantially free of any water and contains primarily amorphous aluminum phosphate. (Do we need differentiate adsorbed water from composition of bulk water?)
2. Publications reference related to formation of aluminum phosphate derived from pyrolysis of tributyl phosphate and aluminum acetylacetonate dissolved in ethanol. Based on techniques such as X-ray absorption near edge structure (XANES), Extended X-ray absorption fine structure (EXAFS) and Transmission electron microscopy (TEM) the authors suggests that there are two types of aggregates, the first based on the structure of tridymite  $\text{AlPO}_4$  (“tridymite clusters”) and the second, based on the structure of amorphous alumina (amorphous “alumina clusters”). Pyrolysis of tributyl phosphate together with aluminum acetylacetonate gives “tridymite clusters”. Pyrolysis of aluminum



acetylacetonate alone resulting in the formation of "free" amorphous "alumina clusters" part that consists of aluminum not bonded to any phosphorus. These observations were supported by XANES data recorded at Al K-edge. Thin films with P-rich composition show XANES spectrum with absorption energy peaks closer to that of crystalline  $\text{AlPO}_4$  (Berlinite) and Al-rich compositions show XANES spectrum closer to energy values observed for alumina. The XANES spectra of the thin films of both P-rich and Al-rich shows it to be a weighted addition of the  $\text{AlPO}_4$  and alumina spectra indicating the presence of these two types of aggregates are present in the thin films reported in the prior art. In contrast to the prior art material, the present Inventive Material composition of amorphous aluminum phosphate is substantially homogenous and free of aggregates and do not contain amorphous alumina.

3. UK 1, 322, 726 and associated references describe a unique route to obtain amorphous aluminum phosphate, but their final product contains at least 1 wt% chlorine dispersed within the amorphous aluminum phosphate film. The Inventive Material is substantially free of chlorine, thus differentiating the product clearly from prior art.